Can Intracameral Dexamethasone at the Conclusion of Routine Cataract Surgery Reduce Post-Operative Complications?

Omar Selim, Zain Charfare, Ayley Loh, Bimal Kumar, Julian Robins, Anant Sharma

INTRODUCTION

Various Regimens exist to mitigate the risks of cataract surgery with the standard being patient-administered drops. (1) This method is cost effective (2); easily titratable; and has demonstrably resulted in low complication rates.(3)

However, there are limitations, including: a significant latency in postoperative administration and the potential for suboptimal patient adherence.

PURPOSE

This study explores the effect of adding Intracameral (IC) dexamethasone at the conclusion of cataract surgery on the incidence of post-operative complications, and as a potential solution to some of the limitations mentioned above.

METHODS

All cases of uncomplicated cataract surgery operated on by six surgeons over a one-year period in a single hospital were retrospectively analysed. Patients were divided into two groups with surgeon assignment recorded.

Group 1 ('Drops Only') under three surgeons received 1mg intracameral cefuroxime at the conclusion but no IC dexamethasone. Post-operative regimen included 3 weeks of topical dexamethasone 0.1% (Maxidex) 4x daily and ketorolac 0.5% (Acular) 3x daily.

Group 2 ('IC dexamethasone') under the remaining three surgeons received 0.33mg intracameral dexamethasone (0.1ml of dexamethasone sodium phosphate 3.3mg/ml for injection, manufactured by Hameln Pharma Ltd) at the conclusion of surgery in addition to the Drops Only regimen (including intracameral cefuroxime as in Group 1).

For both groups, exceptions applied to patients with highly pigmented iris, or who required iris hooks or a Malyugin ring during surgery. These patients received an extended course of Maxidex: 4x daily for 2 weeks then 2x daily for 4 weeks. Regimens are summarised in Table 1.

Patients had routine optometry follow up 4-6 weeks post-operatively. Complication rates were extracted from electronic patient record (EPR) and the differences between the two regimens were statistically analysed using a Fisher exact test ($\alpha = 0.05$).

Complications were classified into the following types: Cystoid macular oedema (CMO), Uveitis, Corneal oedema and Elevated intraocular pressure (IOP).

Complication rates were calculated for both regimens and for each complication type and analysed statistically.

Post-surgery regimen	
Group 1: drops only group	Group 2: IC dexamethasone group
• 1mg intracameral cefuroxime at the conclusion of surgery • ketorolac 0.5% 3 times daily for 3 weeks • topical dexamethasone 0.1% eye drops 4 times daily for 3 weeks	• 0.33mg intracameral dexamethasone • 1mg intracameral cefuroxime at the conclusion of surgery • ketorolac 0.5% 3 times daily for 3 weeks • topical dexamethasone 0.1% eye drops 4 times daily for 3 weeks

Table 1: Post-surgery regimens

RESULTS

A total of 3,531 patients were covered in this study, of which 1,948 belonged to Group 1 (Drops Only group) and 1,583 to Group 2 (IC dexamethasone group).

The IC dexamethasone group showed lower complication rates across all categories except Uveitis (which remained equal); however the results did not achieve statistical significance.

No adverse side effects were reported in the IC dexamethasone group.

Table 2 and Figure 1 summarise the results.

DISCUSSION

IC dexamethasone provides immediate, targeted action in the anterior chamber. This has been shown to improve early post-operative inflammation and subjective recovery when used as an adjunct.(4) Enhanced subjective recovery, patient satisfaction, and reduced complaint rates are critical metrics of surgical success.(4)

Lack of statistical significance may stem from rapid IC dexamethasone clearance. With aqueous humor turnover at 1–1.5% per minute (5), clearance most likely occurs within 100 minutes. This short duration raises potential doubts with regards to efficacy.

Pre-existing comorbidities, particularly epiretinal membrane (ERM), reduce the predictability of cataract surgery and elevate complication risks. In this study, 3 of 4 CMO cases in the IC dexamethasone group had ERM, a significant risk factor with a reported relative risk of 2.67–5.6.(6,7) Similarly, CMO in the Drops Only group was linked to ERM (2 patients) or mechanical pupil dilation (2 patients), both established risk factors.(8)

Excluding patients with established risk factors (ERM and mechanical pupil dilation), the incidence of CMO was lower in the IC dexamethasone group (n = 1) versus the 'Drops Only' group (n = 4). These preliminary findings suggest a protective effect of IC dexamethasone in low-risk eyes, warranting further investigation in larger controlled studies.

Despite these risks, complication rates remained low in both regimens.

Study limitations include its retrospective, single-centre design involving six surgeons and uncontrolled variables, such as a variable post-operative review window (4–6 weeks); Furthermore, prescribing extended drop regimens based on subjective surgeon assessments of iris pigmentation introduced potential confounding.

CONCLUSION

IC dexamethasone appears to lower complication rates without adverse effects; however the reduction was not statistically significant.

The IC dexamethasone group had only one case of CMO in a patient with no prior risk factors, compared to four such cases in the "drops only" group. This suggests that IC dexamethasone may provide a protective effect for standard-risk patients, though further controlled studies are needed to confirm significance.

		Total Cases	CMO	Uveitis	Corneal Oedema	Elevated IOP
IC Dex. Group	Complication	15	4	8	0	3
	No Complication	1568	1579	1575	1583	1580
	Complication Rate	0.90%	0.25%	0.51%	0.00%	0.19%
Drops Only Group	Complication	28	8	10	5	5
	No Complication	1920	1940	1938	1943	1943
	Complication Rate	1.40%	0.41%	0.51%	0.26%	0.26%
	p-value	**0.22**	**0.56**	**1**	**0.07**	**0.74**

Table 2: Results of the study

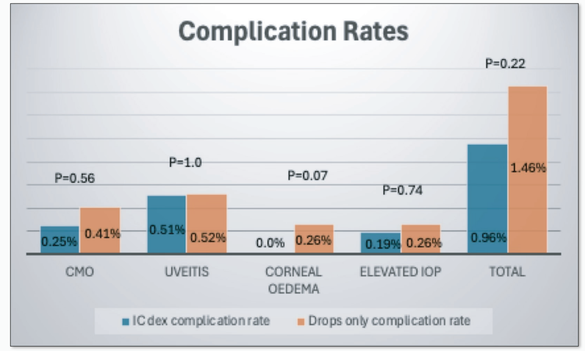

Figure 1: Complication rates

REFERENCES

1. Erichsen JH, Forman JL, Holm LM, Kessel L. Effect of anti-inflammatory regimen on early postoperative inflammation after cataract surgery. J Cataract Refract Surg. 2021;47(3):323. doi:10.1097/j.jcrs.0000000000000455
2. Weiner G. Savvy Steroid Use. American Academy of Ophthalmology. January 2, 2013. Accessed November 28, 2025. https://www.aao.org/eyenet/article/savvy-steroid-use
3. Wielders LHP, Schouten JSAG, Winkens B, et al. European multicenter trial of the prevention of cystoid macular edema after cataract surgery in nondiabetics: ESCRS PREMED study report 1. J Cataract Refract Surg. 2018;44(4):429-439. doi:10.1016/j.jcrs.2018.01.029
4. Chang DTW, Herceg MC, Bilonick RA, Camejo L, Schuman JS, Noecker RJ. Intracameral dexamethasone reduces inflammation on the first postoperative day after cataract surgery in eyes with and without glaucoma. Clin Ophthalmol Auckl NZ. 2009;3:345-355. doi:10.2147/opth.s5730
5. Goel M, Picciani RG, Lee RK, Bhattacharya SK. Aqueous Humor Dynamics: A Review. Open Ophthalmol J. 2010;4:52-59. doi:10.2174/1874364101004010052
6. Schaub F, Adler W, Enders P, et al. Preexisting epiretinal membrane is associated with pseudophakic cystoid macular edema. Graefes Arch Clin Exp Ophthalmol Albrecht Von Graefes Arch Klin Exp Ophthalmol. 2018;256(5):909-917. doi:10.1007/s00417-018-3954-4
7. Chu CJ, Johnston RL, Buscombe C, Sallam AB, Mohamed Q, Yang YC. Risk Factors and Incidence of Macular Edema after Cataract Surgery: A Database Study of 81984 Eyes. Ophthalmology. 2016;123(2):316-323. doi:10.1016/j.ophtha.2015.10.001
8. Taipale C, Holmström EJ, Ilveskoski L, Tuuminen R. Incidence of pseudophakic cystoid macular edema in eyes with and without pupil expansion device. Acta Ophthalmol (Copenh). 2019;97(7):688-694. doi:10.1111/aos.14007